GEOMETRY.

Solutions of Problem 210 have been received from J. E. Sanders, Hackney, O.; Charles E. Barrett, Anchorage, Ky., and Charles A. Carpenter, Student in Adelphi Academy, Brooklyn, N. Y.

Solutions of Problem 211 have been received from J. E. Sanders, Hackney, O., and John D. Cutter, Student in Adelphi College, Brooklyn, N. Y.

174. Proposed by B. F. FINKEL, A. M., 204 St. Marks Square, Philadelphia, Pa.

Given two triangles ABC and $A'B'C'$ lying in the same plane. The side $B'C'$ cuts the sides AC, BC, and AB in the points I, H, and G, respectively; the side $A'B'$ cuts the sides AC, BC, and AB in D, F, and E, rrspectively; and $A'C'$ cuts AC, BC, and AB in M, L, and K, respectively. Prove that

$$(DA'.EA'.A'F)(GB'.HB'.B'I)(MC'.LC'.C'K)$$

$$=-(KA'.A'L.A'M)(FB'.B'E.B'D)(IC'.C'H.C'G).$$

Solution by G. W. GREENWOOD, A. M. (Oxon), Professor of Mathematics and Astronomy in McKendree College, Lebanon, Ill.

Since AC is a transversal cutting the sides $A'B'$, $B'C'$, $C'A'$ of the triangle $A'B'C'$ in the points D, I, M, respectively, we have, by the theorem of Menelaus,

$$A'D.B'I.C'M=-B'D.C'I.A'M.$$

Writing down the corresponding results for the other transversals, we get, by multiplying, the result required.

Also solved by G. B. M. Zerr, A. M., Ph. D., Parsons, W. Va.

213. Proposed by H. F. MacNEISH, University High School, Chicago, Ill.

Construct an equilateral triangle which shall have its vertices in three given parallel lines.

Remark by G. I. HOPKINS, Manchester, N. H.

The solution follows easily from the solution of Geometry Problem number 156 in the MONTHLY for November, 1901.

Independent solutions have been received from R. A. Wells, Bellevue, Neb.; G. W. Greenwood, Lebanon, Ill.; G. B. M. Zerr, Parsons, W. Va.; A. H. Holmes, Brunswick, Maine, and the Proposer.

214. Proposed by H. F. MacNEISH, A. B., University High School, Chicago, Ill.

Inscribe in a given circle a triangle whose sides shall pass through three given points.

Solution by G. W. GREENWOOD, B. A. (Oxon), Professor of Mathematics and Astronomy, McKendree College, Lebanon, Ill.

Denote the fixed points by X, Y, Z. Take on the circle any number of points A_1, A_2, ... Draw A_1X cutting the circle again in B_1; draw B_1Y cutting the circle again in C_1; draw C_1Z cutting the circle again in D_1.

Perform the same operation with A_2, ... thus determining the points D_2, ... The ranges A_1, A_2, ..., D_1, D_2, ... are homographic. Construct their double points which will give two (real or imaginary) positions of a point A with which D will coincide.